EMAIL INVADERS

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the RAINBOW

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VOL. I NUMBER 8

The Monthly Magazine for Color Computer Users

Editor's Notes...

PRINT #-2,

Those of you who are long-time readers of the RAINBOW will observe that this issue is fatter than any we have ever published. That means there is more information exclusively for Color Computer owners here than ever before.

There's a reason for it, frankly. You may also observe that there are more advertisments this month than ever before. First of all, we believe advertisments can be helpful to you in expanding/augmenting your Color Computer system. But, second, the ads help bring you the RAINBOW at a reasonable cost.

Have you priced a good printer lately? If you have, you know that it is expensive printing the RAINBOW and that paper and labor costs increase all the time. And, even with bulk rate mail, it costs in excess of 80 cents to prepare, print and mail the RAINBOW to each of you. Without the ads, we would be cuttting costs by producing smaller issues. And that would mean less information. With the ads, we can bring you more information each month.

That's one of the main reasons we ask you to patronize our advertisers. And, it is also one of the reasons we ask you to mention the RAINBOW when you do.

But, we will never become an ad-heavy publication. We aim at about 33 percent advertising, which means if we get 100 pages of ads,

(Continued on Page 4

UNDER the RAINBOW

Videotex To Disc...
Income Tax Helper...
Fantasy Game Aid #3...
Flowcharting Help...
Disc Index!
Prettyprinting...
Software Reviews...
And MUCH MORE!

Tutorial

PILFERING IN LOW MEMORY

By Wayne A. Diercks

There comes a time in the life of every midnight programmer when 4K of RAM (2343 bytes for CoCo), or even 16K (14,631 bytes using POKE 25:NEW in Extended Color Basic) are just not enough for the elaborate application.

You've already compacted your program statements as much as possbile and you may have unreserved some of the 200 bytes of string storage allocated on power-up by use of the CLEAR statement.

Don't give up yet. There's one more trick to try -- pilfer some lower memory!

On power-up the computer, being a bit greedy, automatically "grabs" the first 1536 bytes of Random Access Memory (RAM) for itself. The top 512 bytes from address 1024 to 1535 are used to store and display the

(Continued on Page 22)

PREPARE FOR TAX TIME...EASILY

By Lawrence C. Falk

Last month we made sure that your checkbook was in balance, and now we're ready to take that balanced checkbook and start work on your income tax return for 1981.

TAXTAB will categorize all your checks and make it pretty easy to see where to put those deductions. At the same time, it will also total up all your income so you can tell how much money you've made during the year.

When next month's RAINBOW arrives, there will be a program that plugs in this month's information to a tax form (1040) so you can do your own taxes.

In order to make TAXTAB as universally useful as possible, we've set it up so youu enter your information as DATA statements, beginning with line 361. You can put in one entry for each line (or a number of them on a line if you'd like) through line number 998. If you need more lines, (you also need a CPA) you can move line 999 to 1999 and use the additional space.

Obviously, you can change the input structure and save the data to tape or disc. We're leaving it as a DATA statement program to insure speed.

Data lines are structured into three strings and one numeric variable. The first string, R$, tells what sort of an entry you are making, Income or Expense. The second string, TT$, refers to the TYPE of entry -- Interest Income, MDs, Local Taxes, etcetera. Refer to lines 82, 91 and 92 for the proper codes.

Next we have ID$, which is an actual description of the item. This might be "1981 Property Taxes" or the like. Finally, AM is the dollar amount. A typical input line would look like this:

```
361 D,MD,Dr. Smith,45
```

The "D" is for deduction, MD means physicians, Dr. Smith is the physician's name, and 45 is the amount of money paid. If you imbed commas in these data statements, be certain to enclose that part of the statement in quotes, because commas are data field terminators.

This program is written with an optional hard copy printout for the LP VII. Note the "IF PR" statements before all the PRINT #-2,'s. If you do not have a printer, you can still key this program in as written and just answer "N" or "NO" to the question of whether to use the printer. This is a handy technique to use to allow either dual or single output.

Finally, since tax information is confidential, we've added a "password" to this program. If you don't answer the password correctly in line 4, the program jumps to line 2000 and erases itself. You might wish to change the password from my first name to something else.

To use this program, merely go through your checkbook and write a DATA line for each deductible item and for all the income items you have. Run it for a printout either to the screen or a printer.

You don't have to do all the entering at once, but you will have to resave the entire program (with the newly added DATA lines) after each session.

The listing:

(Continued on Page 5)

the RAINBOW
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Lawrence C. Falk -- Editor

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The RAINBOW is published every month of the year.

Editor:

I found Jorge Mir's machine tape finder/saver to be very useful. However, I found some tapes which returned a SN ERROR when I tried to RUN the utility.

I discovered a simple way to get around this: CLOADM"",10000. When the start, end, entry list shows on the screen, subtract the offset from the end and entry values, reload the tape in question, and CSAVEM with your newfound values.

M. J. Keyes
Franklin, Tenn.

Editor:

I subscribe to several computer publications and there is one thing that is disturbing to me. There seems to be a tendency for experts to write to each other — to show off their skills.

Most Color Computer owners are not machine language experts and need explainations of how to actually run some of the programs. I typed in a program from (another publication) and couldn't get past the first entry. The accompanying article didn't actually get into using the program, but told how the program was developed. We need more "what to do if's..."

Tom Nee
Pittsburgh, Pa.

Editor:

I have just received my first copy of the RAINBOW and I am very pleased. I read an article by a University professor and decided to share some of my experiences with you.

I teach seventh grade biology and we have about 300 students at our school. I bought a TRS-80 Color Computer and 60 students each gave me $5 for membership. The school also donated $300. I then contacted a Gerald Berg, a computer programmer. He made many useful programs for the students and I would like to describe two of them for the benefit of any teacher who owns a Color Computer.

The first presents new material to students in the form of a multiple choice and will hold 40 questions. There are various responses and scores, depending whether the student gets the question right or wrong on the first or a subsequent attempt. The program also keeps a score for the student.

The second is a grade averager which I find excellent for averaging my grades. It has the added feature of allowing me to add or subtract numbers without changing the divisor and tells me the number of grades as well as the number of extra credit grades.

The computer programmer who wrote these can be contacted through The Berg Works, Box 742, Janesville, WI 53547.

Congratulations on a very fine magazine!

Thomas J. Vogt
Clinton, Wis.

Editor:

We're interested in getting a Special Interest Color Computer User's group going in the Dallas area. Would you please ask all Color Computer users in this area to give me a call about joining?

I can be reached at (214) 464-6999 between 8 a.m. and 5 p.m. and at (214) 224-4444 at other times.

We'd like to get together for mutual benefit and assistance.

R.V. Scott
DeSoto, TX

Editor:

I just received my first issue of the RAINBOW and was very impressed with it. Keep up the good work.

The article by John L. Urban was very good. I would like to add that for a correct simulation of dice rolling is the combination (sum) of the random numbers produced. For example, the roll of two six-sided die would be:

```
A=RND(6)
B=RND(6)
PRINT A+B
```

This would give you the correct odds of rolling certain numbers. Also, the numbers produced would be between 2 and 12, not 1 and 12 if you use only one RND function.

Joseph A. Hasenstaub
Lakewood, OH

Editor:

I really enjoyed the GET and PUT article.

I'm especially interested in information on running the CoCo at 1.8 mhz. It looks like the hardware design can't handle it, except by luck.

My standard 16K Extended Basic machine can run programs, but will not perform the I/O. I installed 2.0 mhz 6821's, but could input only for a while with a fan cooling the 6809. As soon as the 6809 got warm, I was back where I was. I then bought a 2.0 mhz 6809 and then nothing worked at 1.8 mhz. It looks like the buses need buffers.

Richard Krankoski
Elk Grove Village, IL

Editor:

One great interest I have is finding the POKE to reverse the lower-case blocks. I realize that the final answer was given by a Dennis Kitsz in 80-Microcomputing, but I am hoping that someone will come out with a complete system to go 80 columns or 64 columns for word processing.

William Sanford
Juneau, AK

? #-2 From Pg. 1

we'll print another 200 pages of copy. Enough said.

You may also notice this column has a new title. Well, we think its better than just "Editor's Notes." And, you may also notice there are no more spaces between paragraphs -- because we would rather fill that space with information than with space.

We are giving thought to listing out programs in a type size similar to that of our letters column. We know it will make it somewhat more difficult to read, but, again, it would mean more information. We welcome your input. As you know, all listings are set to the 32-character Color Computer screen size. To make it easier to check your typing.

And to the many who join us this month for the first time, greetings. We appreciate your willingness to wait -- but we can't "start" a subscription when we get an order (who does?) because of the high cost of mailing individual copies. If you want back issues, we do have a limited supply of Nos. 1-5. No copies of No. 7 are available, and only a few of No. 6.

We also encourage you all to tell your friends and local computer stores about us. The more copies we sell, the lower our per-copy cost. And the more money we will have to spend on editorial content.

We want to be the best computer magazine you receive. We welcome your input, contributions and suggestions.

UPDATE ON PROCESSORS

Last month our feature story was on four word processing programs. We promised at the time to keep you up to date on them.

Both C.C. WRITER by Transformation Technologies and WORD PROCESSOR/TEXT EDITOR by John Waclo have now been converted for use by the CoCo disc. Disc versions of both programs have been received by the RAINBOW this month and both have been checked out. Both work well.

We also understand that TELEWRITER's disc version is in its final stages of testing.

CO-RESIDENT EDITOR/ASSEMBLER (CORES9)

CORES9 is a complete full function editor/assembler package that will allow you to create, edit and assemble 6809 machine language programs for the color computer. It features a powerful full function text editor and supports the entire 6809 instruction set with all addressing modes, forward and reverse lable references, will output object code directly to memory or "CLOADM" compatible tapes and much more. Price $39.95

TEXT EDITOR

This program is a line/character oriented text editor for the color computer, that will enable you to create and edit text files for Basic programs, letters, text data files, or almost anything you might want to put on paper. It features functions for adding, inserting, deleting, moving and copying text lines or paragraphs; powerful string search and replace commands, single and automatic line numbers and line editing with 9 sub commands to insert, delete, change, add and remove individual or mutiple characters. Tape commands allow you to save, load, append, and skip tape files; also it is compatible with Basic ASCII tape formats. A MUST HAVE PROGRAM!!

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Trsmon is a 2K system monitor program that will allow you to explore the workings of the color computer. It features 9 debuging comands, tape load and save compatible with Basic "CLOADM", up/down load via RS232 port, terminal package that allows the color computerto be used as a teminal at baud rates up to 9600 baud and a printer driver to direct display output to the printer for memory dumps, disassemblys etc. The program is position independent so it can be moved anywhere within the system memory. A very powerful tool at a very reasonable price.

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```
0 '*********TAXTAB**********
1 '*** (c) FALSOFT 1982*****
2 '
3 CLS:PRINT:PRINT:PRINT
4 PRINT "   THIS IS AN INCOME TA
X LIST   PROGRAM.  TO GAIN ENTRY
 TO IT,  YOU MUST ENTER AN ACCES
S CODE.     PLEASE ENTER THE COD
E AT THE QUESTION MARK."
5 PRINT:INPUT "   <ENTER> CODE H
ERE";CD$:IF CD$<>"LONNIE" THEN 2
000
10 CLS
20 REM TRS-80 LOCATOR
30 REM ***DATA INITIALIZATION**
35 PRINT:INPUT"  DO YOU WANT YOU
R OUTPUT TO GO TO THE PRINTER";G
F$:IF LEFT$(GF$,1)="Y" THEN PR=1
:CLS
40 M=1000
50 PRINT:INPUT "SHALL I PRINT AL
L ENTRIES (Y/N)";A$
60 PRINT
70 IF A$="Y" THEN 3600
72 CLS: PRINT@64,"DO YOU WISH. .
 ."':PRINT
73 PRINT"  1-INCOME TABLES"
74 PRINT"  2-DEDUCTION TABLES"
75 PRINT"  3-TAX SUMMARY":PRINT"
  4-END PROGRAM":PRINT
76 INPUT "  <ENTER> APPROPRIATE
NUMBER";Z
77 IF Z=3 GOTO 2999
78 IF Z=4 THEN END
79 IF Z=2 GOTO90
80 CLS:PRINT:PRINT@8,"INCOME SEL
ECTOR":PRINT
82 PRINT"(W)  WAGES",,"(II) INTE
REST INCOME","(D)  DIVIDENDS",,"
(OI) OTHER INCOME":PRINT
84 INPUT "      <ENTER> APPROPRIA
TE CODE";X$
85 GOTO100
90 CLS:PRINT:PRINT@6,"DEDUCTION
SELECTOR":PRINT
91 PRINT "(MD) DOCTORS",,"(M)  M
EDICINE AND DRUGS","(MI) MEDICAL
 INSURANCE","(ST) STATE TAXES PA
ID","(LT) LOCAL TAXES PAID","(RE
) REAL ESTATE TAXES","(BT) SALES
 TAXES PAID"
92 PRINT "(PT) PERSONAL PROPERTY
 TAX","(HI) MORTGAGE INTEREST","
(CI) CHARGE AND CREDIT INTEREST"
,"(AI) AUTOMOBILE INTEREST"
93 PRINT"(nf) NEXT FRAME FOR MOR
E INFO:?
94 INPUT "      <ENTER> SELECTIO
N";X$:IF X$="" OR X$="NF" THEN 9
5 ELSE 100
95 CLS:PRINT@5,"MORE DEDUCTION S
ELECTOR":PRINT:PRINT"(CC) CASH C
ONTRIBUTIONS","(NC) NON-CASH CON
TRIBUTIONS","(TF) CASUALTY & THE
FT LOSS","(EB) EMPLOYEE BUSINESS
 EXPENSE","(MS) MISCELLANEOUS DE
DUCTIONS"
96 PRINT"(RP) RETURN TO PREVIOUS
","(RM) RETURN TO MASTER FRAME"
97 PRINT:INPUT "     <ENTER> SEL
ECTION";X$
98 IF X$="RP" THEN 90
99 IF X$="RM" THEN 72
100 CLS:PRINT
101 IF PR THEN PRINT#-2,CHR$(31)
:GOTO102 ELSE 122
102 IF X$="W" THEN PRINT#-2,"
     WAGES"
103 IF X$="II" THEN PRINT#-2,"
 INTEREST INCOME"
104 IF X$="D" THEN PRINT#-2,"
    DIVIDENDS"
105 IF X$="OI" THEN PRINT#-2,"
 OTHER INCOME"
106 IF X$="MD" THEN PRINT#-2,"
   DOCTORS"
107 IF X$="M" THEN PRINT#-2," ME
DICINE & DRUGS"
108 IF X$="MI" THEN PRINT#-2," M
EDICAL INSURANCE"
109 IF X$="ST" THEN PRINT#-2,"
 STATE TAX PAID"
110 IF X$="LT" THEN PRINT#-2,"
 LOCAL TAX PAID"
111 IF X$="RE" THEN PRINT#-2,"RE
AL ESTATE TAXES PAID"
112 IF X$="BT" THEN PRINT#-2,"
 SALES TAXES PAID"
113 IF X$="PT" THEN PRINT#-2,"PE
RSONAL PROPERTY TAX PAID"
114 IF X$="HI" THEN PRINT#-2,"
   MORTGAGE INTEREST"
115 IF X$="CI" THEN PRINT#-2,"CH
ARGE AND CREDIT INTEREST"
116 IF X$="AI" THEN PRINT#-2,"
  AUTOMOBILE INTEREST"
117 IF X$="CC" THEN PRINT#-2,"
    CASH CONTRIBUTIONS"
118 IF X$="NC" THEN PRINT#-2,"
NON-CASH CONTRIBUTIONS"
119 IF X$="TF" THEN PRINT#-2,"TH
EFT AND CASUALTY LOSSES"
120 IF X$="EB" THEN PRINT#-2,"EM
PLOYEE BUSINESS EXPENSES"
121 IF X$="MS" THEN PRINT#-2,"
 MISCELLANEOUS DEDUCTIONS"
122 PRINT:IF PR THEN PRINT#-2,CH
R$(30)""
130 PRINT
140 PRINT"TYPE";TAB(7)"DESCRIPTI
ON";TAB(24)"AMOUNT":IF PR THEN P
RINT#-2,"DESCRIPTION";TAB(37)"AM
OUNT"
150 REM
```


(Continued on Page 6)

TAX From Pg. 5

```
160 PRINT"====";TAB(7)"========"
;TAB(24)"====":IF PR THEN PRINT#
-2,"===========";TAB(37)"======"
:PRINT#-2,""
180 REM **PROCESSING AREA**
190 FOR I=1 TO M
200 READ R$
210 IF R$="END" THEN 320
220 READ TT$,ID$,AM
230 IF A$<> "Y" THEN 260
245 PRINTTT$;TAB(3)ID$;TAB(21)AM
:LN=LN+1:IF PR THEN PRINT#-2,TT$
;TAB(5)ID$;:PRINT#-2,TAB(37);:PR
INT#-2,USING"$###,###.##";AM
247 AT=AM+AT
260 IF TT$<>X$ THEN 310
270 S=S+1
280 IF S=1 THEN 300
290 TT$=" "
300 PRINTTT$;TAB(3)ID$;TAB(21)AM
:LN=LN+1:IF PR THEN PRINT#-2,ID$
;:PRINT#-2,TAB(32);:PRINT#-2,USI
NG"$###,###.##";AM
305 AT=AM+AT
310 IF PR=0 AND LN=12 THEN PRINT
" PRESS <ENTER> TO CONTINUE":I
NPUTZ$:LN=0:CLS:GOTO140 ELSE GOT
O315
315 NEXT I
320 REM ***TERMINATION***
330 PRINT:IF PR THEN PRINT #-2,"
"
335 PRINT "    TOTAL --->";TAB(2
0)AT:IF PR THEN PRINT#-2,CHR$(31
)"    TOTAL"CHR$(30);:PRINT#-2,T
AB(25);:PRINT#-2,USING"$###,###.
##";AT
337 PRINT STRING$(32,"*");:IF PR
 THEN PRINT#-2,STRING$(80,"-")
339 IF PR THEN PRINT#-2,""
340 INPUT"  PRESS <ENTER> TO CON
TINUE";Z$:CD$="LONNIE":CLS:RUN30
360 REM ***DATA ENTRIES FOLLOW**
999 DATA END
2000 PRINT:PRINT:PRINT
2001 CLS:PRINT:PRINT:PRINT:PRINT
TAB(13)"'";CD$;"'":PRINT "    IS
 not THE PROPER CODE":PRINT:PRIN
T "    THE PROGRAM HAS BEEN ERAS
ED FROM COMPUTER MEMORY.":NEW
2999 CLS:PRINT:PRINTTAB(11)"TAX
SUMMARY":IF PR THEN PRINT#-2,CHR
$(31)TAB(14)"TAX SUMMARY"CHR$(30
):PRINT#-2,""
3000 FOR Q=1 TO 1000:READ R$
3005 IF R$="END" THEN 3050
3010 IF R$="I" THEN 3500
3020 READ TT$,ID$,AM
3030 DD=DD+AM
3040 NEXT Q
3050 PRINT"TOTAL DEDUCTIONS:";TA
B(22)DD:IF PR THEN PRINT #-2,"TO
```

(Continued on Page 8)

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Software Review

GATOR ZONE

Where else but up East in the heart of Preppyland could there be a game that lets you get back at all the alligator people?

From IMB (P.O. Box 289, Williamstown, MA, 01267, $18.95) comes GATOR ZONE, where you can do battle against IZOD-looking alligators before they eat up your shirts.

As always with IMB, the graphics are sensational. This one takes place on a 3D-looking landscape with mountains in the background. The gators scuttle across a GATOR ZONE looking for shirts to eat, and you have to blast them before they do.

The shirts appear at random, and you get a little advance warning with a "shirt alert!" Then, its up to you to get the gator before the gator gets the shirt!

If this all sounds a little silly, I suppose it is. But GATOR ZONE is a blast to play. The only one around here who doesn't like it is our "veddy preppy" 13-year-old who -- as those of the age will -- cannot see the humor in it all. If you're tired of alligator shirts, penny loafers, Mummy and Muffy, GATOR ZONE will do you a world of good. And, if your nickname happens to <u>be</u> Muffy, this game is different enough for you to enjoy it.

Button down your collar...grab your joystick...and head for the GATOR ZONE. You'll be pleased.

C. C. Writer

[Word Processing for the TRS-80¢ Color Computer]

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All versions include System Binder, Cassettes or Disk with storage pockets, and documentation. (Shipping late Feb.)

For information or orders write:

TransTek BSC 2-3
194 Lockwood
Bloomingdale, IL 60108

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TAX From Pg. 6

```
TAL DEDUCTIONS:";:PRINT#-2,TAB(3
2);:PRINT#-2,USING"$###,###.##";
DD
3500 IF R$="END" THEN 3530
3505 READ TT$,ID$,AM
3510 HH=HH+AM
3520 GOTO 3040
3530 PRINT"TOTAL INCOME:";TAB(22
)HH:IF PR THEN PRINT #-2,"TOTAL
INCOME:";:PRINT#-2,TAB(32);:PRIN
T#-2,USING"$###,###.##";HH
3540 VV=HH-DD
3550 PRINTTAB(23)"--------":IF P
R THEN PRINT #-2,TAB(32)"-------
------"
3560 PRINT "ADJ. GROSS INCOME";T
AB(22)VV:IF PR THEN PRINT #-2,"A
DJ. GROSS INCOME";:PRINT#-2,TAB(
32);:PRINT#-2,USING"$###,###.##"
;VV
3570 GOTO337
3600 PRINT:IF PR THENPRINT #-2,"
"
3601 PRINT "ALL ENTRIES":IF PR T
HEN PRINT #-2,CHR$(31)"  ALL ENT
RIES"CHR$(30):PRINT#-2,""
3602 PRINT"TYPE";TAB(7)"DESCRIPT
ION";TAB(24)"AMOUNT":IF PR THEN
PRINT#-2,"TYPE"TAB(5)"DESCRIPTIO
N"TAB(37)"AMOUNT"
3603 PRINT"====="TAB(7)"========
==="TAB(24)"======":IF PR THEN PR
INT#-2,"===="TAB(5)"==========="
TAB(37)"======":PRINT#-2,""
3604 GOTO180
```

COMPUTERWARE'S 32K UPGRADE

By Rick Smith

The 16K to 32K RAM memory expansion kit from COMPUTERWARE (Dept. C, Box 668, Encinitas, CA 92024, $84.95) claims to be unique because it requires only a simple snap-in, solderless installation and it allows full graphics capability throughout the 32K of memory. I certainly do not dispute either of these contentions, even though they remain unproven to me -- largely due to the fault of Radio Shack, not COMPUTERWARE. And, that in no way diminishes my favorable impression of this upgrade.

The kit, as delivered, contains a logic board with eight 16K RAM chips and one Quad NOR Gate, a 32K diagnostics cassette, a set of clear, well-written instructions and a useless little tool called an Olfa Touch Knife. Throw the knife away or use it as a letter opener. Keep the board -- it is first rate and of high quality both in materials and appearance!

Before you do anything, you will need a Phillips screwdriver, some masking tape, an IC extractor and a good utility knife. The IC extractor is recommended. Then, after reading the instructions, the installation can be performed in an hour -- working at a leisurely pace (and I'm no "hardware hacker").

Although no soldering is required, you do have to cut a trace in order to get the graphics capability throughout the 32K. This should be done with a good utility knife. Note that is not necessary in order to get the additional memory -- and you might wish to pass. When the installation is complete, it all fits neatly under the RF shield.

There are, however, some problems that may be encountered, as they were by this reviewer. The faults, however, were Radio Shack's, not COPMPUTERWARE's.

Unless the chip sockets on the CoCo's motherboard are properly aligned and level -- and the motherboard is unwarped -- the kit simply will not snap in. On my 16K Extenmded Color Basic with a serial number in the low 13000's, the socket for the 40-pin SAM chip had a pronounced list to port. My problem was further complicated by my klutzy removal with thumb and forefinger of the 20-pin flip-flop. This bent some of the pins. On straightening them, one broke off.

All these difficulties were solved with the generous assistance of a technically competent friend (who, incidentally, owns a Computerland store). He removed the old 40-pin socket and soldered in a new one, this time flat on the motherboard. The broken chip was replaced easily.

I then carefully cut the trace itself and, voila!, the kit fit and worked.

If you are one of the very few unlucky who finds his Color Computer motherboard too warped or its sockets too tilted to enable installation of the COMPUTERWARE kit and can't find help to correct the problem, COMPUTERWARE will accept return of the kit and refund the purchase price in full.

Now that the kit is installed and my system is back up, I am trying to figure out how to utilize its expanded capabilities. The dreaded OM ERROR seems to be a creature of the past. The extra graphics memory isn't accessable through the BASIC commands PCLEAR and PMODE (e.g., PCLEAR 12, PMODE 3,11), but then it isn't available at all on any other conversion, as far as I know. As these new capabilities are explored and discovered, I will share them with you.

In summation, COMPUTERWARE's kit is a good buy which most owners will find easy to install. This reviewer would like to state that, despite innuendo from Tandy's "Microcomputer News," the COMPUTERWARE 16+ kit IS compatible with 1.0 version of Extended Basic ROM.

DISABLE THE BREAK KEY?

Here's a "hardware" solution to disabling the BREAK key on your CoCo.

Put a top from Neo-Synepherine over the key. It fits real tight and will keep fingers from hitting BREAK accidentally.

Be sure the inside of the top is dry, so no liquid leaks down into the keyboard -- or who "nose" what trouble you might have.

Software Review

BIORHYTHM & MINE FIELD

Where was Rainbow Connection Software when I really needed them? Thinking up ingenious things, no doubt.

One of the first programs I just had to have after I got my CoCo was a Biorhythm plotter. Now, I don't believe in them, but I think they are really neat and love the way the little markers curve around the screen. Hunting and hunting, I finally found one on the DEC-10 at the University of Louisville. I spent three days converting it ... and $200. The reason for the latter was simple, I needed 16K to run it.

Rainbow Connection's Biorhythm program runs in 4K and displays the charts in full detail on the screen. There's a printer option but it isn't necessary. And, it is as complete a Biorhytm program as I've seen. Also, very easy to use.

As part of the same Twinpack tape is a game called MINEFIELD. I like it. In MINEFIELD, the computer creates an unseen minefield and you have to plot your ship through it. You get a warning when a mine is near. Frankly, its a lot of fun to play and requires some logic and patience. I DID win. Once.

Both of these programs are available from Rainbow Connection, 3514 6th Place NW, Rochester, MN 55901 for $9.95. Both run in 4K! And, frankly, they're an excellent buy.

ML Rabbit

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VIDEOTEX TO DISC

By Jim & Michael Dudgeon

The following procedure will allow you to make a disc copy of the VIDEOTEX program. It was developed as a joint effort of my 14-year-old son, Michael, and myself.

The major difficulty in this procedure occurs because the cassette VIDEOTEX is written to overrun and destroy many of the low RAM locations used by BASIC, including locations HEX 72 and 73, which define the RESET "jump to program" vector.

Thus, the ties to BASIC and the DOS are lost, which prevent the user from transferring VIDEOTEX to disc.

This technique relies on the CLOADM offset feature, which will allow you to load VIDEOTEX into the upper part of RAM. Because you do this, you also replace the instructions in VIDEOTEX which redefine the reset pointer vector with NOP's (No OPerations in machine language). Then, after saving VIDEOTEX on disc, you will always execute it at its high memory entry point.

The steps below, for a 16K system, preserve entry back into BASIC using the reset key (for access such as VIDPRINT from the October issue of the RAINBOW):

1. Load VIDEOTEX from cassette using CLOADM "VIDEOTEX", 11000
2. Alter the shifted program with the following POKES: POKE 13104,18:POKE 13105,18:POKE 13109,18:POKE 13110,18
3. Save VIDEOTEX on disc using SAVEM "VIDEOTEX",12700, 14850,12728

Note that the SAVEM addresses are decimal and not hexidecimal as stated in our version of the DOS manual.

4. Execute the program using EXEC 12728.

If this procedure is followed, pushing the reset key returns the system to BASIC. VIDEOTEX can always be reentered using EXEC 12728, provided none of its addresses in high memory have been disturbed.

A final comment is that for 32K systems, more pages of VIDEOTEX are possible if larger offset values are used to shift the program to the top of the 32K memory space.

POLYGON AGAIN

We've sure received a lot of great comments about R. Foulke's POLYGON program from the December issue. Some people, in fact, think a certain computer manufacturing and marketing corporation may have adapted it for their latest in-store demo of the Color Computer's capabilities.

Ah, well. Oscar Millican sent in the following program which modifies POLYGON a little bit to allow for keyboard control.

The listing:

```
10 REM POLYGON
20 REM BY R. FOULKE - MODIFIED BY
   OSCAR MILLICAN
21 CLS
22 INPUT "RND(N)";N
23 INPUT "TIMER";Z
25 PMODE 4,1:PCLS:SCREEN 1,1
30 PI=3.14159:M=RND(N)
35 FOR T=0 TO 2*PI STEP PI/75
40 R=COS(M*T)*95
45 X1=COS(T)*R+128:Y1=SIN(T)*R+96
50 A=T+PI/3
53 R2=COS(M*A)*95
55 X2=COS(A)*R2+128:Y2=SIN(A)*R2+96
60 LINE(X1,Y1)-(X2,Y2),PSET
70 NEXT T
75 FOR T=0 TO Z:NEXT T
80 GOTO 25
```

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FULL FEATURE TEXT EDITOR WITH UPPER CASE AND LOWER CASE CHARACTERS, WITH UP TO 42 CHARACTERS PER LINE DISPLAYED ON THE SCREEN. ADJUSTABLE TABS, TEXT SEARCH AND REPLACEMENT, BLOCK MOVE. JUSTIFICATION AND PROPORTIONAL SPACING WHEN USED WITH THE LP-VII.

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and requires absolutely no hardware modifications

TELEWRITER

Telewriter is a powerful word processor designed specifically for the Color Computer. It can handle almost any serious writing job and it is extremely easy to use. It has all the advanced features you need to create, edit, store, format and print any kind of text. With Telewriter you can quickly produce perfect, finished copy for letters, reports, term papers, articles, technical documentation, stories, novels, screenplays, newsletters. It is also a flexible and efficient way to take notes or organize ideas and plans.

51 × 24 DISPLAY

The Color Computer is an incredibly powerful and versatile computer, but for text editing it has some major drawbacks. The small 32 character by 16 line screen format shows you too little of the text and, combined with its lack of lower case letters, bears little resemblance to the way text really looks on the page. Reverse video in place of lower case just adds confusion.

Telewriter eliminates these shortcomings with **no hardware modifications required**. By using software alone, Telewriter creates a new character set that has **real lower case letters**, and puts 24 lines of 51 characters on the screen. That's more on-screen characters than Apple II, Atari or TRS-80 Model III. That's more than double the Color Computer's standard display.

FULL SCREEN EDITOR

The Telewriter editor is designed for maximum ease of use. The commands are single key (or single key plus control key), fast, and easy to remember. There is no need to switch between insert modes and delete modes and cursor movement modes. You simply type. What you type is inserted into the text at the cursor, on the screen. What you see on the screen is always the current state of your text. You can move quickly through the text with one key cursor movement in all 4 directions, or press the shift key simultaneously for fast, auto-repeat. You can jump to the top or bottom of the text, the beginning or end of a line, move forward or backward a page at a time, or scroll quickly up or down. When you type past the end of a line, the wordwrap feature moves you cleanly to the next.

You can copy, move or delete any size block of text, search repeatedly for any pattern of characters, then instantly delete it or replace it with another. Telewriter gives you a tab key, tells you how much space you have left in memory, and warns you when the buffer is full.

FORMAT FEATURES

When it comes time to print out the finished manuscript, Telewriter lets you specify: left, right, top, and bottom margins; line spacing and lines per page. These parameters can be set before printing or they can be dynamically modified during printing with simple format codes in the text.

Telewriter will automatically number pages (if you want) and automatically center lines. It can chain print any number of text files from cassette without user intervention. You can tell it to start a new page anywhere in the text, pause at the bottom of the page, and set the Baud rate to any value (so you can run your printer at top speed).

You can print all or any part of the text buffer, abort the printing at any point, and there is a "Typewriter" feature which allows you to type straight to your printer. Because Telewriter lets you output numeric control codes directly (either from the menu or during printing), it works with any printer. There's even a special driver for the Epson MX-80 that lets you simply select any of its 12 fonts and do underlining with a single underline character.

CASSETTE HANDLER

Telewriter makes cassette as simple to use as possible. It will search in the forward direction til it finds the first valid file, so there's no need to keep retyping a load command when you are lost in your tape. You can save all or any part of the text buffer, and you can append pre-existing files to what you have in the buffer already. You can abort an append or filesearch without harming the program or the text in the buffer.

Telewriter will maintain compatibility with popular Color Computer disk systems, but, since it makes using cassette almost painless, you can still have a powerful word processor without the major additional cost of a disk.

AVAILABLE NOW

Telewriter turns your Color Computer into the lowest cost hi-power word processor in the world today. It runs in 16K or 32K (32K recommended) and is so simple you can be writing with it almost immediately. It comes with complete documentation and is fully supported by Cognitec. Telewriter costs $49.95 (California residents add 6% tax). To order or request more information write:

Cognitec
704 Nob Ave.
Del Mar, Ca. 92014

Or call (714) 755-1258 (weekdays, Saturdays, and early morning). We will gladly answer your questions.

Apple II a registered trademark of Apple Computer, Inc., Atari a registered trademark of Atari, Inc., TRS-80 a registered trademark of Tandy Corp., MX-80 a registered trademark of Epson America, Inc.

The Pipeline takes a slightly different form this issue because of a slightly unique situation. For those of you who read or have heard about a publication called 80-Microcomputing, the news in the publisher's column this month may have been a bit shocking.

Wayne Green, the publisher of 80-Micro, led off his monthly dissertation in January with a prediction, quoting only "dealers," that the Color Computer will soon be phased out by Tandy.

Green added he had not called anyone in Ft. Worth to ask about this rumor, simply because he believed he would just get a denial, anyway. We might suggest that even though a journalist may believe he knows the answer to a question, its his duty to ask it of the most reliable source anyway.

The RAINBOW did call Ft. Worth and spoke with Jon Shirley, vice president of computer merchandising. Shirley had not seen the story yet, but termed the report "absolutely ridiculous!"

"Wayne is wrong," Shirley said.

Shirley also confirmed for the RAINBOW what we had heard unofficially, the CoCo was the "hottest item for Radio Shack all through the Christmas season." Color Computers, Shirley added, "sold to the bare walls. We didn't even have any left in the warehouse."

It is not the RAINBOW's intention to go to war with Wayne Green, but we do feel a few notes might place this "news" item in perspective.

80-Microcomputing has tried very hard to win a share of the CoCo market, with little success. Green has asked, editorially, for several months for CoCo submissions. He admits they have not been forthcoming. He also says few programs have been received by his in-house software marketing firm.

We believe there is a good reason for this -- and the reason is not that CoCo owners are treating this computer as a "toy," as Green implies. Rather, a substantial support market has grown up for CoCo through sources other than Green's. The RAINBOW is but an example. And this month, we have more advertising for Color Computer products than does 80-Micro.

One of the reasons for this is simply -- as our advertising says -- we carry more programs and information on CoCo than all the "big" computer magazines combined.

One of the reasons the RAINBOW was established in the first place was that we were tired of wading through all the Model I, II and III, Apple, Atari and so forth programs in every magazine under the sun, hoping someone would toss us a program for "our" computer now and then. We feel we -- and our advertisers -- are meeting your needs. We're not going to kiss off CoCo, and we don't believe Tandy will, either. From a pure profit standpoint, that would be a pretty silly thing to do.

Back to what The PIPELINE is for...

The special investment analysis program from Radio Shack is expected to be available by mid-March. And

(Continued on Page 22)

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CHART YOUR FLOW ... AND WATCH 'EM GO

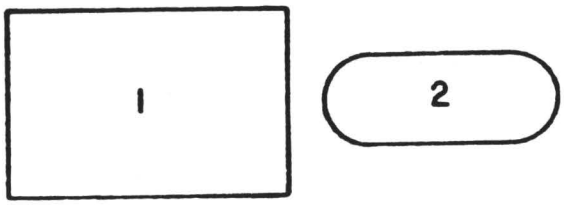
By Joe E. Bennett

The symbols shown on this page, numbered one to ten, may seem like nothing more than a mass a geometric shapes. But, when you put them in a group, these symbols may help make you a better programmer.

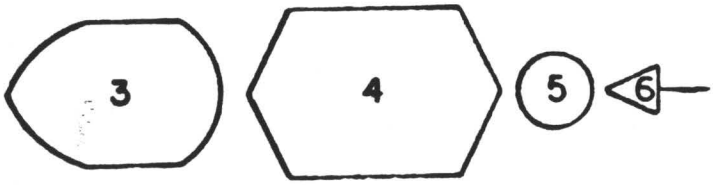
With proper use, you can plot the course of a program from start to finish -- and all of the sidesteps and subroutines you may take in between.

Flowcharting may not be the ultimate solution to your programming needs, but it may be one very positive solution to the debugging blues.

To many neophyte programmers and a few hard-core hackers, flowcharting is a tool of mainframe computer users and of not much use to us CoCo people. Why waste time putting your program on paper with all those silly symbols when you could be adding that great new algorhythm to your latest version of Star Trek, and debugging it at the same time?



To answer this question, we must take a trip back in time (complete with Rod Serling narrative) to those mysterious days of yore before there were microcomputers. In those days, when computer time was measured in terms of hundreds of dollars an hour, a programmer had to have his work ready to run the first time it was entered into the computer. More than 90 percent of a programmer's time was spent debugging a program before it ever ran on a computer. Logic flow errors are the hardest to detect, and could cause anything from a minor program slowdown to a full system crash.



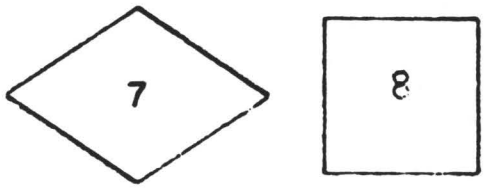
To help detect the logic flow errors, a system was devised to allow a program to run off-line. This system was, as you've probably guessed by this time, called flowcharting.

Of course, flowcharting isn't needed in all programs. If you're writing short programs with few branches, don't do it. But, if your programs are medium-length or longer, and you do a lot of branching to subroutines, then a flowchart may be just what you need to aid the tedious chore of debugging and determining logic flow. Trying to keep up with all the variables, gosubs and gotos can be difficult at best.

Some of the advantages to flowcharting are:

-- Standard symbols are readily understood and recognized.

-- Flowcharts can be read by someone without programming experience.



-- Flowcharts can be divided into smaller sections. The chart can then be examined for overall progress.

-- Flowcharts can be an invaluable aid in tracking program errors.

-- Many aids exist in flowcharting, such as templates and drawing packages.

Of course, there are disadvantages as well. Among them are:

-- Flowcharts are difficult to design and draw.

-- It is not easy to debug a flowchart.

-- Flowcharts tend to become cluttered.

(Continued on Page 15)

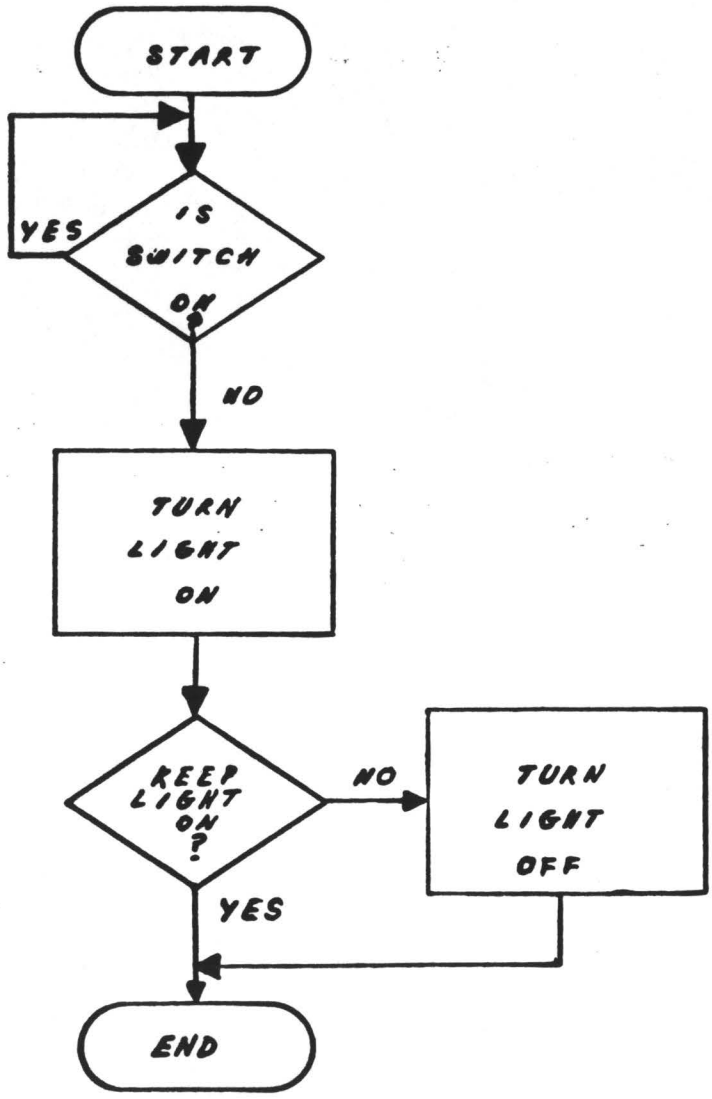
They only show program organization.

Flowcharts allow for unstructured programming techniques.

With all of these disadvantages to consider, why take the time to flowchart?

The answer lies in program logic. If you can think in terms of computer logic, then this may help your program run smoother, more efficiently and, perhaps, faster.

Let's take an everyday situation and flowchart it. Turning on a light is, in itself, a very simple task requiring little personal energy and less thought. It can be flowcharted this way:

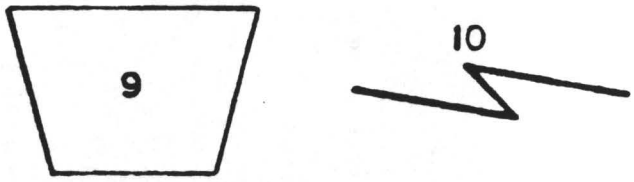


As you can see from the illustration, we can flowchart many decision programs, as well as many aspects of logic flow, to produce the main sub-logic flow of any program.

Each flowchart symbol has a distinct function and meaning. There are others, but space will not allow for explaination of all the variations. The ones we're dealing with here should be adequate for most needs and enough to get you started on your own flowcharts.

One way to become familiar with these symbols and with flowcharting in general is to make a flowchart of an everyday suitation -- like our light turning-on example. Some suggestions would be cooking a specific meal, calling a friend, driving to work or getting ready for bed. These may be simple examples, but they should help you become familiar with techniques.

The meanings of the symbols used in this article are:



1. PROCESS/ANNOTATION - Describes the process, instructions and/or data.
2. START/END - Shows the beginning or end of a program or logic flow.
3. DISPLAY - Display of the television or CRT.
4. PREPARATION - Initialization or preparation of data.
5. CONNECTOR - Connects sections of the flowchart to other pages or other sections of the chart.
6. ARROW - Indicates the direction the program moves.
7. DECISION - Indicates yes/no or if/then questions. A line will trace the next step on the logic design.
8. AUXILIARY OPERATION - For subroutines.
9. MANUAL OPERATION - Can be used to indicate instructions to the user, manual input/output, and so forth.
10. CONNUNICATIONS LINK - Usually a modem connection.

This should give you some insight to what is involved in flowcharting. Hopefully, it will be a valuable aid to you in program design. With some practice, you should be able to use a flowchart with a minimum of concentration on the techniques of the process itself.

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INVADERS

Snail Invaders is a RAINBOW exclusive, brought to you through the good offices of Illustrated Memory Banks (IMB).

SNAIL INVADERS is a joint effort of Fred B. Scerbo, vice president and software author for IMB, and Dale Haggerty, a.k.a. "Snail," a 16-year-old student at Drury High School in North Adams, MA.

Scerbo writes that "Dale served as the inspiration for "SNAIL INVADERS" and helped out by designing the title card and snail graphics for the game." The body of the program and working mechanisms were designed by Scerbo.

"Dale is very talented in art," Scerbo adds. "Using the Color Computer for graphics is a new tool for him, and he has proudly displayed this game to many high school friends who want the chance to play SNAIL INVADERS."

Scerbo also notes you should not try to run the program until you have entered all the lines. Because it uses a speedup routine, you could hang up the computer and have to switch it off to regain control. If that happens, you'll lose everything you've typed.

To save, type POKE 65494,0:CSAVE "SNAIL" <ENTER>

No part of this game may be reproduced or adapted for use in other games or programs. If you wish to use the IMB screen scoring routine, you must contact IMB. Fred promises us an article on the routine for a future issue.

As with all software printed in the RAINBOW, SNAIL INVADERS is provided for your personal use only. You are authorized to make two (2) tape copies for your own use. For information on additional copies or reproduction arrangements, contact IMB at P.O. Box 289, Williamstown, MA, 01267.

The directions: You can move your cannon by pressing the left and right arrow keys. Fire by using the space bar. A sneaky snail will shoot back at you at random. You only have three cannons. When the snails reach the end of the screen, they will reset. To replay the game, press BREAK and RUN.

And remember...snails are slow, but sneaky.

LET'S GO. . . ESCARGOT!!

```
1 POKE65495,0:CLEAR500:CLS0
3 SR=3:C=3:P$=CHR$(128):FORI=2TO
14:FORJ=4TO13:SET(J,I,C):NEXTJ:N
EXTI
5 FORK=0TO11STEP11:FORJ=18TO23:S
ET(J+K,2,C):NEXTJ:FORJ=17TO24:SE
T(J+K,3,C):NEXTJ:FORI=4TO14:FORJ
=16TO25:SET(J+K,I,C):NEXTJ:NEXTI
:NEXTK
7 FORK=0TO7STEP7:FORJ=39TO58:FOR
I=2TO7:SET(J,I+K,C):NEXTI:NEXTJ:
FORI=3TO6:SET(59,I+K,C):NEXTI:FO
RI=4TO5:SET(60,I+K,C):NEXTI:NEXT
K
9 PRINT@257,P$;:FORY=1TO28:READA
:PRINTCHR$(A);:NEXT
11 DATA105,108,108,117,115,116,1
14,97,116,101,100,128,128,128,10
9,101,109,111,114,121,128,128,12
8,98,97,110,107,115
13 PRINT@329,P$;:FORY=1TO12:READ
A:PRINTCHR$(A);:NEXT
15 DATA98,111,110,117,115,128,12
8,128,103,97,109,101
17 PRINT@399,CHR$(98)+CHR$(121);
19 PRINT@448,P$;:FORY=1TO31:READ
A:PRINTCHR$(A);:NEXT
21 DATA102,114,101,100,128,115,9
9,101,114,98,111,128,128,97,110,
100,128,128,100,97,108,101,128,1
04,97,103,103,101,114,116,121
23 FORI=1TO2000:NEXT:GOTO43
25 PMODE3,1:PCLS:SCREEN0,0:DRAW"
S24BM20,72;C4E4L3E4R3G3R3G5NL3BR
2E5R2F2E2R2G5L2H2G2L2BR10E5R3D5L
2UBUL2ERDBDL3GL2BR10U5R3D5L3BR5U
5R2D3RF2L5"
27 DRAW"S16BM8,110;C3U2R2U4L2U2R
6D2L2D4R2D2L6BR7U8R2F3U3R2D8L2H3
D3L2BR8BU2U6R2D5FEU5R2D6G2L2NH2B
R5U8R2F8L3H3BUH2D2R2BDL2D3NL2BR9
U3H5R9F2D4G2L4BE2U4RFD2GLBD2BR5U
8R5D2L3DR2D2L2DR3D2L5BR6U8R4F2DG
2F3L2H3BUU2RFGLBDD3L2BR8"
```

(Continued on Page 27)

Game Aids #3

GENERATING A FRP CHARACTER

By John L. Urban

Here, as I promised in the January issue of the RAINBOW, is the Character Generator program.

```
10 'CHARACTER GENERATOR PROGRAM
20 'PROTOTYPE 1.0
30 '(c) JARB SOFTWARE
40 ST$=""
100 CLS:INPUT "WHAT IS THY NAME"
;NAME$
450 CLS:PRINTTAB(4);"* CHARACTER
 GENERATOR *":PRINT
500 GOSUB30000:ST=X
510 IF ST=18 THEN GOSUB30010:GOT
0520
515 PRINTUSING"STRENGTH     = ##"
;ST:ST$=STR$(ST):IF LEN(ST$)<3 T
HEN ST$=" "+ST$
520 GOSUB30000:IN=X:IF IN<3 THEN
 520
525 PRINTUSING"INTELLIGENCE= ##"
;IN
530 GOSUB30000:WI=X:IF WI<3 THEN
 530
535 PRINTUSING"WISDOM       = ##"
;WI
540 GOSUB30000:DE=X:IF DE<3 THEN
 540
545 PRINTUSING"DEXTERITY    = ##"
;DE
550 GOSUB30000:CO=X:IF CO<3 THEN
 550
555 PRINTUSING"CONSTITUTION= ##"
;CO
560 GOSUB30000:CH=X:IF CH<3 THEN
 560
565 PRINTUSING"CHARISMA     = ##"
;CH
568 PRINT:PRINTNAME$;","
570 PRINT"ART THOU SATISFIED WIT
H THIS        CHARACTER?":LINEINP
UT "(<Y>ES, <N>O, <E>ND)?";A$
575 IF A$<>"Y" THEN 450
580 PRINT:INPUT"WOULDST THOU LIK
E A PRINTOUT OF     THIS CHARACTE
R";A$
585 IF A$<>"Y" THEN 605
590 PRINT#-2,"CHARACTER FOR "NAM
E$;":";CHR$(10)
595 PRINT#-2,"STRENGTH     ="ST$:
PRINT#-2,USING"INTELLIGENCE= ##"
;IN:PRINT#-2,USING"WISDOM       =
 ##";WI:PRINT#-2,USING"DEXTERITY
   = ##";DE
```

(Continued on Page 19)

COLOR COMPUTER DISK SYSTEM

A complete disk drive system for the color computer, featuring the Tall Grass Technology Double density, buffered disk controller. This system will support up to 4 51/4 in. disk drives with a maximum capacity of 3.2 Mega bytes of storage using double sided 80 track drives. This is a minimum of 4 times the capacity of the "Standard" color computer disk drive system.

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The second system is a completely supported external access system for interfacing with virtually any program requiring the use of the disk system. It includes 10 functions for opening, closing, reading, writing sequencial and random access files. There are also 13 subroutine functions and 7 I/O subroutines accessable to the programmer.

The third system is a Basic interface system which includes 6 direct execute Basic commands and 6 indirect commands which conform to the standard Basic tape & printer I/O commands and allow use of string and numeric variables for disk parameters. Up to 9 files can be active at once, all disk file memory allocation is done automatically at run time. Also, Basic has access to all the free standing DOS commands either directly or under program control.

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```
600 PRINT#-2,USING"CONSTITUTION=
 ##";CO:PRINT#-2,USING"CHARISMA
   = ##";CH
605 INPUT "ANOTHER CHARACTER";A$
:IF A$<>"Y" THEN CLS:END
610 RUN
1000 END
30000 X=RND(18):RETURN
30010 Y=INT(RND(0)*101)
30015 ST$=STR$(ST)+"/"+STR$(Y)
```

Now, here's a breakdown of the lines in the program above:

40 Clears ST$

100 Asks for person (or character) name

450 Clears screen, print heading

500-515 Strength generator. If strength equals 18, then we GOTO 30010 to get a percentile.

530-565 Repeat process (except for percentile routine if X=18). Variables are IN=intelligence, WI=wisdom, DE=dexterity, CO=constitution, CH=charisma.

568-575 Ask player if the character is OK. If not, do the routine again.

580-585 Asks if you would like a printout. If not, then GOTO 605 for another character.

590-600 Printout character on the printer.

605 Asks if you want to create another character. If not, then END. If yes, then run the program again.

1000 Catch-all. If we missed any chance of the program going past 610, then we must prevent an error from happening.

30000 Random routine to choose the characteristics.

30010-30020 If ST=18 then make ST$=ST+"/"+percentile

EXAMPLE RUN No. 1

CHARACTER FOR JOHN

```
Strength     =16
Intelligence= 8
Wisdom       =16
Dexterity    = 6
Constitution=18
Charisma     = 6
```

EXAMPLE RUN No. 2

CHARACTER FOR JOHN

```
Strength     =18/ 83
Intelligence=16
Wisdom       = 8
Dexterity    = 7
Constitution=16
Charisma     = 4
```


Above are two examples of a run of the program.

I always think of an average (or median) for these characteristics as being 9-12. Anything above or below this median starts to add or detract from your rolls in combat and other situations.

Example #1 shows a fairly average character, except for charisma and wisdom. The charisma being 6, our hero is just a little bit less than handsome (or beautiful if the character is female). Charisma is not always how beautiful or handsome the character is. It is mainly used in determining how your character might influence others. So, I would not use this character in a popularity contest.

But the wisdom is a 16, which means the character will normally be able to detect any suspicious activity when his or her curiosity is aroused. However, with his intelligence being only an 8, he would probably overlook the more subtle clues.

(Continued on Page 28)

Silly Syntax

By Sugar Software

A hilarious and outrageous story game for one to ten players. This game will become one of your favorite to play and show off. Create your own stories with the built-in screen editor or order story tapes from the selection below. Silly Syntax features include creating, modifying, printing, saving and loading of stories. Included is the Silly Syntax game, two stories and the user guide.

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As you can see, in creating a character -- and in determining his or her personality -- you must look at the characteristics as a whole. I would say that example #1 is a pretty ordinary person.

Character #2, on the other hand, is not so average.

Personally, I prefer a character who isn't a superman in strength. This character could be compared to Conan in strength. He is very close to being super-human. A rating of 18/100 would be interpreted as 19, which is to say, super-human. So, he will look something like Lou Ferrigno. His intelligence, being 16, will also make him extra-smart. This will come in handy, should the situation warrant brains over brawn. His wisdom, being what it is, is more than a slight disadvantage, although he would not be totally oblivious to all clues in search for adventure.

Unfortunately, his dexterity would make him prone to fall over his feet in combat. But not too many people will laugh at him. Luckily, he has a constitution of 16, which means he will be extraordinarily brave.

All in all, he will be very close to being super-human, if a bit clumsy.

You, as a referee, have the final say in who does what to their character. I would not recommend that the group you referee be all Conan-types. Neither should they all be super-scholars, or whatever.

By no means is this character generator program complete. As a variation, you could create a routine to ask for input of information if the player prefers to bring in an already-created character. Or, you could create files on cassette or disc to update the characters as the game is played, as a reference to you and for the other players.

This will be the subject of my next article in the series. Please feel free to make any adjustments to the program to suit your needs -- and share them with me if you would like. You can write in care of the RAINBOW.

Till then, may you be rich in your ventures.

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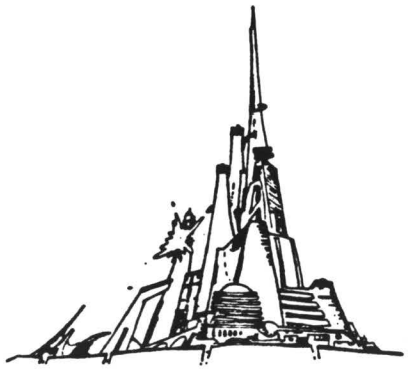

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Software Review

SILLY SYNTAX

Just when you think you've seen about everything anyone can do with the CoCo, along comes something totally unique which is really a joy to load in. Such a program is SILLY SYNTAX (from Sugar Software, 2153 Leah Lane, Reynoldsburg, OH 43068, for $19.95).

My hat's off to Gary Davis, the author and his wife, Susan, who had a lot of input into the idea for SILLY SYNTAX. The program is based on the ever-popular party game where people take turns supplying some name, part of speech or whatever and end up with oddball sentences and stories guaranteed to produce a bunch of laughs.

For the youngsters -- and there are several "story tapes" available including fairy tales -- this can be a real educational process as well. When the program asks for a noun, that's a pretty easy way of getting a kid interested in knowing a noun is a "person, place or thing."

One person can play, or a whole group. The computer asks for certain words to fill in blanks, and then writes out a whole story using those words. The results are, in a word, fun.

I found the program, for 16K Extended Basic, easy to use. There is a very complete instruction book, and two stories included with the basic program. Other tapes are the aforementioned fairy tales, advernture, science fiction, gothic romance, current events, sing-along and X-rated. Output is to the screen or a printer. I can't wait to see more of the tapes ($9.95 each, 10 percent discount for an order of three or more).

I really like this fine effort in creative programming!

HOW PRETTY IT IS TO PRINT PRETTY

One of the things most of the preliminary books on BASIC tell us is that "prettyprinting" can help debug programs. But, alas, the Color Computer doesn't seem to want to prettyprint.

Prettyprinting is, basically, just using indentations to make things look like they go together. The best example is in a FOR/NEXT loop, where all the material which stays inside the loop is indented a number of spaces so that its easy to spot the material that is enclosed in the loop.

There is a whole range of other "rules" for prettyprinting, but most of them make use of spaces. And, if you have ever tried to tab over after the line number with CoCo, you know that, on listing the program again, CoCo just takes up the spaces and puts your first BASIC word or variable after the line number.

But you <u>can</u> prettyprint. The way to do it is simply to make the first character after the line number a colon (:). Once that's there, you can prettyprint to your heart's content.

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LOW MEMORY From Pg. 1

low-resolution or text screen information -- which is absolutely necessary unless your program uses only the high-res pages in higher memory.

Most of the bottom 429 bytes from address 0 to 428 are used as pointers, buffers, interrupt vectors and other necessary functions and are not to be tampered with. This area is of extreme importance, however, for advanced programming techniques although it is not useful as additional storage.

At RAINBOW CONNECTION SOFTWARE, we have found this situation leaves us with RAM addresses 420 to 1023 and, yes, these may all be "pilfered" from the Color Computer for your use under most circumstances.

That's 595 bytes of additional emergency memory that you never knew you had!

Through experimentation, we have found that only addresses 729 to 753 and 981 to 996 are used often and may impair some operations such as program editing and subsequent loading of programs or data. It is recommended that you always turn off CoCo, wait 15 seconds, and turn it on again (cold start) after using any program that "pilfers" in lower memory.

Just how can this additional memory be used?

Well, unfortunately, it cannot be turned into additional BASIC program storage, but it can be accessed to replace variables, arrays, tables or an entire "hidden screen" of memory by POKEing in any value from 0 to 255 in each byte to be used and later PEEKing those values back out. Usually, after getting the value from low memory storage, each is converted to an ASCII character (letter, number or low-res graphics block) using the CHR$ function. An even better use of this memory is to POKE in a machine language subroutine to be executed from either the BASIC program or from the command mode outside the program. This subroutine will then remain in low memory until the machine is turned off.

In the original version of RAINBOW CONNECTION SOFTWARE's Minefield game, we successfully "pilfered" an entire "hidden screen" of memory (512 bytes) to store our minefield map. During the run of the game, the map was frequently called to the screen display by PEEKing each byte of the hidden map (stored at 429 to 940) and POKEing it into low-res screen memory (1024 through 1535) -- minus the mines, of course. This technique made it possible for us to fit this memory-consuming game easily into 4K.

PIPELINE From Pg. 13

the RS editor-assembler is scheduled for the end of February.

Incidentally, the CoCo with 32K is expected to take some 30 days to obtain. The wait for drive 0 (that's the one you have to have first) is estimated at 60 days.

There is some undocumented speculation afoot that some of the newer software that will be available from Tandy will be disc-based. And, if you havn't seen the documentation on the new ART GALLERY ROM PAC, take a look. We believe you'll be pleased at its completeness (at least compared to some of the other ROM PACs).

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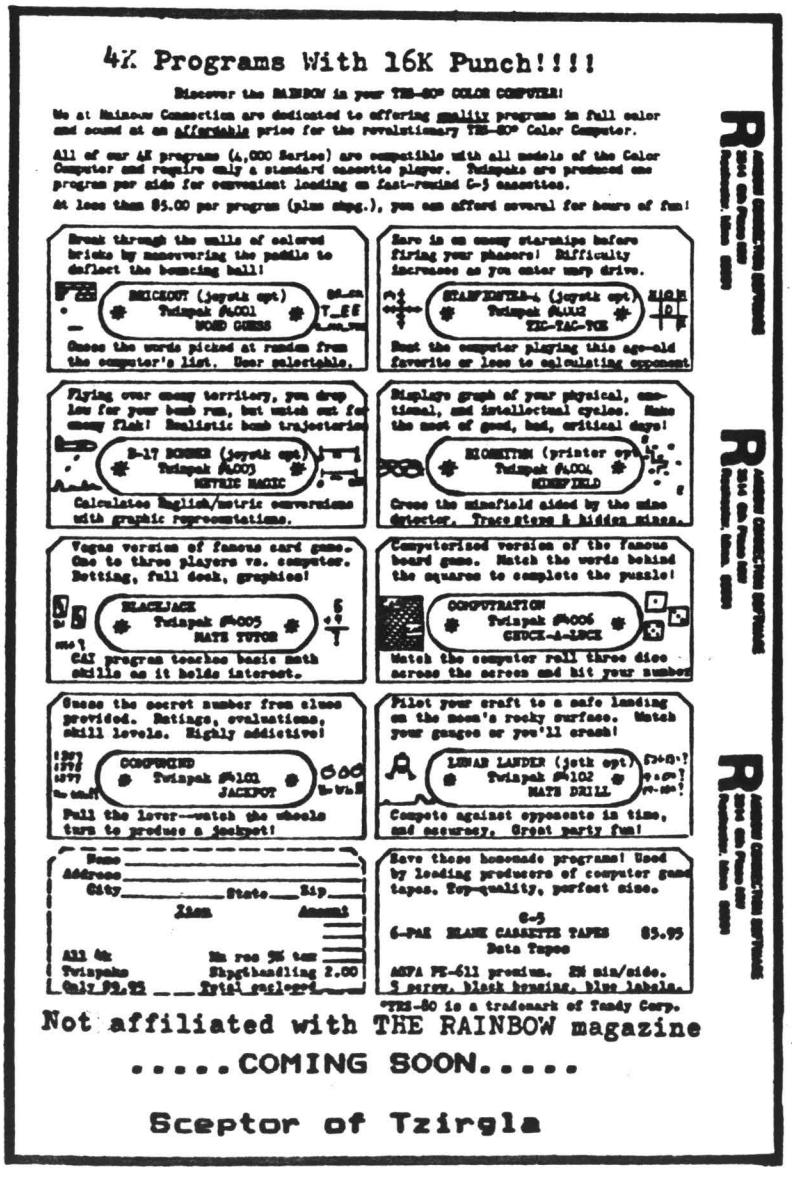
MAKE AN INDEX FOR YOUR DISC

By Jorge Mir

This program, called DSK*INDX creates another BASIC program which, when run, provides a menu of programs on your disc. Programs can then be selected from the menu by simply typing the applicable program number. The selected program is then automatically loaded and run.

The newly-created program, called INDEX, eliminates the need to type in the programs the user wants to run. Young children are relieved of the need to determine whether the programs to be run are written in BASIC or in machine language. It also eliminates the problem of mis-typing the name of a program you wish to load and run.

DSK*INDX, which is a copyrighted program, performs the following functions:



-- It reads the disc directory (track 17) and stores in memory the program names and their related extensions.

-- It sorts the names alphabetically (this can take some time if there are many programs on a disc).

-- It creates a new BASIC program. This is done through the development of program lines as strings, and then copying them to the disc.

-- It kills a previously-created INDEX program before storing the new one. This function is added in case a new program is added to the disc so that the old program can be updated.

Before DSK*INDX starts its work, it checks to see whether there is room on the disc for the new program. It also checks to see if there is already an INDEX program on the disc.

It should be noted the INDEX program will only contain programs with extensions "BAS" or "BIN." This feature was incorporated to allow the user to store programs which could be excluded from the menu printed by INDEX.

A sound is produced by the program when a machine language file is selected from the menu. The sound is long enough to allow the disc motor to stop before the program begins execution. This is because, in most instances, if you attempt to execute a machine language program before the disc stops, the disc will hang up and continue to run. If the location of the machine language program conflicts with the location of INDEX, the machine language program will be loaded but not executed. If this occurs, you must type EXEC to run the program.

If BASIC programs containing graphics produce a syntax error, you should include a PCLEAR 4 statement as the first step in your BASIC program. In order to avoid coinflict with many machine language programs, INDEX relocates itself to location HEX 0E03. With the BASIC pointer at this location, the programs containing graphic statements will produce syntax errors which are then avoided by the PCLEAR 4 statement.

The listing:

(Continued on Page 24)

DISC INDEX From Pg. 23

```
0 '*******************************
1 '
2 '           DSK*INDX
3 '
4 '        BY:  JORGE MIR
5 '
6 '           (C) 1981
7 '
8 '*******************************
9 '
10 CLEAR 10000:DIM N$(60)
20 Y=0:F1=0:F2=0
30 CLS
40 PRINT"   BASIC PROGRAM GENERA
TOR"
50 PRINT:PRINT"   THIS PROGRAM W
ILL GENERATE A BASIC PROGRAM THA
T WILL PRINT A FILE DIRECTORY AN
D AUTOMATICALLYRUN ANY PROGRAM S
ELECTED FROM   THE PRINTED MENU.
"
70 PRINT:PRINT"   PLACE THE DISK
 FOR WHICH YOU WANT TO DEVELOP A
N INDEX IN     DRIVE '0' BEFORE
PROCEEDING."
80 PRINT @480,"   <PRESS ANY KEY
 TO START>";
90 IF INKEY$="" THEN 90
100 SOUND200,5:CLS:PRINT @200,"R
EADING DISK"
110 FOR X=1 TO 9
120 N=0
130 ' @,17,X+2,A$,B$
140 C$=A$+LEFT$(B$,127)
150 NAM$(N)=LEFT$(C$,8)
160 EXT$(N)=MID$(C$,9,3)
170 IF LEFT$(NAM$(N),1)=CHR$(0)
    THEN 190
180 IF EXT$(N)="BAS" OR EXT$(N)=
"BIN"THEN GOSUB 790
190 FOR N=1 TO 7
200 NAM$(N)=MID$(C$,N*32+1,8)
210 IF LEFT$(NAM$(N),1)=CHR$(0)
    THEN 240
220 EXT$(N)=MID$(C$,9+N*32,3)
230 IF EXT$(N)="BAS" OR EXT$(N)=
"BIN"THEN GOSUB 790
240 NEXT N:NEXT X
242 IF F2=1 OR !(0)>1 THEN 250
244 CLS:PRINT"THERE IS NO ROOM I
N THE DISK TO SAVE THE NEW BASIC
 PROGRAM."
245 PRINT:PRINT"YOU MUST 'KILL'
ONE OF THE     PROGRAMS CURRENT
LY STORED IN   DISK BEFORE PROC
EEDING."
246 END
250 N=Y+1
260 CLS:SOUND 200,5:PRINT@199,"D
ATA BEING SORTED"
270 GOSUB820
280 CLS:PRINT"THESE ARE THE PROG
RAMS STORED   IN THE DISK:"
290 PRINT:FOR X=1 TO Y
300 PRINT" "LEFT$(N$(X),8)" "MID
$(N$(X),9,3),
310 IF Y<22 THEN 330
320 FOR S=1 TO 800:NEXT S
330 NEXT X
340 IF POS(0)>1 THEN PRINT
350 PRINT:PRINT"PLEASE STANDBY W
HILE THE NEW   BASIC PROGRAM IS
 BEING CREATED."
360 '***PROGRAM GENERATOR***
365 IF F2=1 THEN !"INDEX/BAS"
370 LX$="ON I GOTO "
380 OPEN "O",1,"INDEX/BAS"
390 LN=0:LN$=""
400 LN$="GOTO 6000":GOSUB1080
410 LN$="DATA BD,B3,ED,1F,02,7E,
96,A7":GOSUB 1080
420 LN$="CLS":GOSUB 1080
430 LN$="CLEAR 2000:DIM N$(60)":
GOSUB1080
440 LN$="PRINT TAB(12)"+CHR$(34)
+"INDEX"+CHR$(34):GOSUB1080
450 LN$="PRINT":GOSUB1080
460 LN$="X=0:Z=1":GOSUB1080
470 LN$="RESTORE":GOSUB1080
480 LN$="FOR I=0TO7:READ E$:NEXT
":GOSUB1080
```

(Continued on Page 25)

```
490 LN$="READ N$(Z):IF N$(Z)="+C
HR$(34)+"END"+CHR$(34)+" THEN"+S
TR$(LN+30):GOSUB1080
500 LN$="Z=Z+1:GOTO"+STR$(LN):GO
SUB1080
510 LN$="A=INT((Z-1)/2)+1":GOSUB
1080
520 LN$="FOR X=1 TO A":GOSUB1080
530 LN$="PRINT USING"+CHR$(34)+"
###"+CHR$(34)+";X;:PRINT"+CHR$(3
4)+" "+CHR$(34)+"N$(X),":GOSUB10
80
540 LN$="IF N$(X+A)<>"+CHR$(34)+
CHR$(34)+"THEN PRINT USING"+CHR$
(34)+"###"+CHR$(34)+";X+A;:PRINT
"+CHR$(34)+" "+CHR$(34)+"N$(X+A)
:NEXT":GOSUB1080
550 LN$="PRINT@480,"+CHR$(34)+CH
R$(34)+";:INPUT"+CHR$(34)+"
  YOUR CHOICE"+CHR$(34)+";I":GOS
UB 1080
560 LN$="IF I<1 OR I>Z THEN"+STR
$(LN) :GOSUB1080
570 LN$="GOTO 5000":GOSUB1080
580 F1=1:FOR X=1 TO Y
590 IF MID$(N$(X),9,3)="BIN" THE
N 630
600 LN$="RUN"+CHR$(34)+LEFT$(N$(
X),8)+"/BAS"+CHR$(34)+":DATA "+L
EFT$(N$(X),8)
610 GOSUB 1080
620 GOTO 650
630 LN$="LOADM"+CHR$(34)+LEFT$(N
$(X),8)+"/BIN"+CHR$(34)+":SOUND
200,50:EXEC:DATA "+LEFT$(N$(X),8
)
640 GOSUB 1080
650 NEXT X
660 F1=0
670 LN$="DATA END":GOSUB1080
680 LN=4990:LN$=LEFT$(LX$,LEN(LX
$)-1):GOSUB1080
690 LN$="CLS:END":GOSUB1080
700 LN=5990:LN$="CLEAR200:FORI=0
TO7:READ E$":GOSUB 1080
710 LN$="POKE&HE03+I,VAL("+CHR$(
34)+"&H"+CHR$(34)+"+E$):NEXT":GO
SUB1080
720 LN$="DEFUSR0=&HE03:X=USR0(&H
E18)":GOSUB1080
730 LN$="GOTO 30":GOSUB1080
740 CLOSE1
750 CLS:PRINT@160,"THE NEW BASIC
 PROGRAM HAS BEEN  GENERATED AND
 STORED IN YOUR    DISK."
760 SOUND 200,25
770 PRINT
780 END
790 Y=Y+1
800 N$(Y)=NAM$(N)+EXT$(N)
805 IF N$(Y)="INDEX    /BAS" THEN
    F2=1
810 RETURN
820 REM*****SORTING ROUTINE*****
830 FOR S1=1 TO N-1 STEP 2
840 S2=S1+1
850 NEXT S1
860 S3=0
870 S4=N
880 S4=INT(S4/2)
890 IF S4=0 GOTO 1070
900 S3=S3+1
910 FOR S5=1 TO S4-1
920 S1=S5
930 S2=S5+S4
940 S6=0
950 IF N$(S1)<N$(S2)GOTO 1000
960 S6=1
970 SS$=N$(S1)
980 N$(S1)=N$(S2)
990 N$(S2)=SS$
1000 S1=S2
1010 S2=S2+S4
1020 IF S2<N GOTO 950
1030 IF S6=0 GOTO 1050
1040 GOTO 920
1050 NEXT S5
1060 GOTO 880
1070 RETURN
1080 LN=LN+10
1090 A$=STR$(LN)+" "+LN$
1100 PRINT#1,A$
1110 IF F1=1 THEN LX$=LX$+STR$(L
N)+CHR$(8)+","
1120 RETURN
```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GIVE US MORE VIPERS!

By Richard White

VIPERS may be Dave Hooper's first cut at game programming, but he has been keeping his light under the barrel regarding other phases of CoCo programming.

Of course, I typed VIPERS in from the December RAINBOW. I came to the DIM statements in line 115 and proceeded to enter only those with (10) or larger since CoCo defaults to (10) if no other number is specified. After all, I'm running 32K and don't like to type.

Now, when I enter a program, I like to test it as I go by running it if this is reasonable. With VIPERS, it was reasonable to RUN100 after each set of DRAW and GET lines after adding a 1000 GOTO 1000 to hold the graphics screen. Line 135 is GET (178,68)-(196,84),B,G. I ran 100 and got a FC ERROR IN LINE 135. That told me that I had to have a DIM (X) statement for any GET command.

Now, the Extended Basic Manual tells us that a two dimension array must be dimensioned for a GET, and that the form for the one above would be (DIM (22,16). I put this in and it worked. I proceeded to put in the rest of VIPERS, "correcting" Dave's DIM statements as I went. I ran it and checked MEM to find I was using nearly 25K bytes.

Now, at this point in the CoCo's development, it is reasonable to expect the typical owner has a 16K machine and any program that would not fit in 16K would be so labeled. Dave's original DIM statements worked, though they are totally different from those in the manual. A quick check proved this out.

So what is the right, and least memory-consuming way to DIM for use of GET's. Dave read the September Radio Shack "Microcomputer News" closer than I did. There Thomas Rokicki provides the following formula, which obviously works:

Array Size=((H x V) -1)/N

Where H=horizonal width; V=vertical length; N=40 for PMODE 3 and 4, or 80 for PMODE 1 and 2, or 160 for PMODE 0.

The lengths and widths are the largest coordinate minus the smallest coordinate for each direction. Most of the time you will get an answer in decimal form, i.e., 7.7896. Round down (in this case, DIM X(7).

This is important if you have stayed away from GET's and PUT's because of the memory consumption of a two dimensional array. I certainly had not given them much thought until I entered Dave's program.

The other neat bit of programming is Dave's use of the PLAY command with tempo T255, note length L255 to generate sound effects. These effects appear in commercial machine language programs -- now we find we can do them from BASIC.

Perhaps Dave will put some words around on how he chooses notes and octaves to get what he wants.

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```
29 DRAW"HUR3EL4U2E3R4G3R3DG4L2":
PAINT(24,70),4,4
31 FORI=1TO5:READA:PAINT(A,70),4
,4:NEXT
33 DATA32,63,118,178,220
35 FORI=1TO8:READA:PAINT(A,90),3
,3:NEXT
37 DATA22,46,72,102,136,170,195,
234
39 FORK=6TO206STEP40:FORKK=0TO48
STEP16:PUT(0+K,120+KK)-(32+K,128
+KK),S,PSET:NEXTKK:NEXTK
41 POKE65494,0:FORK=1TO5:SCREEN1
,0:SOUND20,1:FORI=1TO500:NEXTI:S
CREEN1,1:SOUND1,1:FORI=1TO500:NE
XTI:NEXTK:POKE65495,0:RETURN
43 Z=4:PMODE3,1:PCLS:SCREEN0,0:Q
$="C1BRNU4RU4RD4RU4RD4RU4RNL4D2N
L4D2L6C3"
45 DIMT(24)
47 A$="BR4NU4BR":B$="BR2U2R3U2NL
3BD4NL3":C$="BR2R3U2NL2U2NL3BD4"
:D$="BR2BU2NU2R3U2D4":E$="BR2R3U
2L3U2R3BD4":F$="BR2U4NR3D2R3D2NL
3":G$="BR2BU3UR3D4":H$="BR2U4R3D
2NL3D2NL3":I$="BR2BU2NR3U2R3D4":
J$="BR2U4R3D4NL3"
49 QQ$="V31L25502BB01CC"
51 GB$="ULUL2UR7DL2DLD"
53 SN$="REHLG2FR3E2H2L3G2DFR6U2"
55 SA$="C5REHLG2FR3E2H2L3G2C2DFU
NHDR5C4NUNHNE2RNH"
57 DRAW"S11BM128,92;C3"+SN$
59 PAINT(128,89),2,3
61 DRAW"S11BM128,92;"+SA$
63 DIMS(7)
65 GET(111,86)-(143,94),S,G
67 FORI=1TO90:PSET(RND(43),RND(1
9),RND(5)):NEXT
69 DIME(21):GET(0,0)-(43,19),E,G
71 GG$="U2R4U2R2U2RD2R2D2R4D2L13
"
73 DRAW"S4BM12,192;C3"+GG$
75 PAINT(17,190),3,3
77 DIMF(7):GET(0,185)-(37,192),F
,G:GOSUB25:GOTO137
79 IFM1=0THEN103ELSEIFM1=1THEN10
5ELSEIFM1=2THEN107ELSEIFM1=3THEN
109ELSEIFM1=>4THEN111
81 L1=M2:GOSUB113:MC$=LL$:IFM2=>
10THENM3=M3+1
83 IFM2=>10THENM2=0
85 L1=M3:GOSUB113:MD$=LL$:IFM3=>
10THENM4=M4+1
87 IFM3=>10THENM3=0
89 L1=M4:GOSUB113:ME$=LL$:IFM4=>
10THENM5=M5+1
91 IFM4=>10THENM4=0
93 L1=M5:GOSUB113:MF$=LL$:IFM5=>
10THENM6=M6+1
```


(Continued on Page 28)

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SNAIL From Pg. 27

```
95 IFM5=>10THENM5=0
97 IFM6=>10THENM6=0
99 L1=M6:GOSUB113:MG$=LL$
101 RETURN
103 MA$=J$:MB$=J$:GOTO81
105 MA$=B$:MB$=E$:GOTO81
107 MA$=E$:MB$=J$:GOTO81
109 MA$=G$:MB$=E$:GOTO81
111 MA$=J$:MB$=J$:M1=0:M2=M2+1:G
OTO81
113 IFL1=0THEN115ELSEIFL1=1THEN1
17ELSEIFL1=2THEN119ELSEIFL1=3THE
N121ELSEIFL1=4THEN123ELSEIFL1=5T
HEN125ELSEIFL1=6THEN127ELSEIFL1=
7THEN129ELSEIFL1=8THEN131ELSEIFL
1=9THEN133ELSEIFL1=>10THEN135
115 LL$=J$:RETURN
117 LL$=A$:RETURN
119 LL$=B$:RETURN
121 LL$=C$:RETURN
123 LL$=D$:RETURN
125 LL$=E$:RETURN
127 LL$=F$:RETURN
129 LL$=G$:RETURN
131 LL$=H$:RETURN
133 LL$=I$:RETURN
135 LL$=J$:RETURN
137 PCLS
139 CLS0:SCREEN0,0
141 GOSUB295
143 GOSUB281
145 FORI=0TO176STEP48:FORY=28TO1
28STEP20:PUT(I,Y)-(I+32,Y+8),S,P
SET:NEXTY:NEXTI
147 FORI=0TO180STEP60:BI$=STR$(I
+20):DRAW"S8BM"+BI$+",165;C8U2E3
R12F3D2L4H2L6G2L4":PAINT(I+24,16
3),8,8:NEXTI:SCREEN1,0
149 FORI=1TOSR:DRAW"S4BM"+STR$(1
26+(34*I))+",18;C3"+GG$+"U2R13":
NEXTI
151 FORI=0TO76STEP4
153 GOSUB297:IFPPOINT(20+I,32+Q)
=1THEN157
155 PUT(0+I,28+Q)-(32+I,36+Q),S,
PSET
157 IFPPOINT(20+I,52+Q)=1THEN161
159 PUT(0+I,48+Q)-(32+I,56+Q),S,
PSET
161 IFPPOINT(20+I,72+Q)=1THEN165
163 PUT(0+I,68+Q)-(32+I,76+Q),S,
PSET
165 IFPPOINT(20+I,92+Q)=1THEN169
167 PUT(0+I,88+Q)-(32+I,96+Q),S,
PSET
169 IFPPOINT(20+I,112+Q)=1THEN17
3
171 PUT(0+I,108+Q)-(32+I,116+Q),
S,PSET
173 IFPPOINT(20+I,132+Q)=1THEN17
7
175 PUT(0+I,128+Q)-(32+I,136+Q),
S,PSET
```

(Continued on Page 29)

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```
177 GOSUB297:GOSUB253:IFPPOINT(6
8+I,32+Q)=1THEN181
179 PUT(48+I,28+Q)-(80+I,36+Q),S
,PSET
181 IFPPOINT(68+I,52+Q)=1THEN185
183 PUT(48+I,48+Q)-(80+I,56+Q),S
,PSET
185 IFPPOINT(68+I,72+Q)=1THEN189
187 PUT(48+I,68+Q)-(80+I,76+Q),S
,PSET
189 IFPPOINT(68+I,92+Q)=1THEN193
191 PUT(48+I,88+Q)-(80+I,96+Q),S
,PSET
193 IFPPOINT(68+I,112+Q)=1THEN19
7
195 PUT(48+I,108+Q)-(80+I,116+Q)
,S,PSET
197 IFPPOINT(68+I,132+Q)=1THEN20
1
199 PUT(48+I,128+Q)-(80+I,136+Q)
,S,PSET
201 GOSUB297:GOSUB253:IFPPOINT(1
16+I,32+Q)=1THEN205
203 PUT(96+I,28+Q)-(128+I,36+Q),
S,PSET
205 IFPPOINT(116+I,52+Q)=1THEN20
9
207 PUT(96+I,48+Q)-(128+I,56+Q),
S,PSET
209 IFPPOINT(116+I,72+Q)=1THEN21
3
211 PUT(96+I,68+Q)-(128+I,76+Q),
S,PSET
213 IFPPOINT(116+I,92+Q)=1THEN21
7
215 PUT(96+I,88+Q)-(128+I,96+Q),
S,PSET
217 IFPPOINT(116+I,112+Q)=1THEN2
21
219 PUT(96+I,108+Q)-(128+I,116+Q
),S,PSET
221 IFPPOINT(116+I,134+Q)=1THEN2
25
223 PUT(96+I,128+Q)-(128+I,136+Q
),S,PSET
225 GOSUB297:GOSUB253:IFPPOINT(1
64+I,32+Q)=1THEN229
227 PUT(144+I,28+Q)-(176+I,36+Q)
,S,PSET
229 IFPPOINT(164+I,52+Q)=1THEN23
3
231 PUT(144+I,48+Q)-(176+I,56+Q)
,S,PSET
233 IFPPOINT(164+I,72+Q)=1THEN23
7
235 PUT(144+I,68+Q)-(176+I,76+Q)
,S,PSET
237 IFPPOINT(164+I,92+Q)=1THEN24
1
239 PUT(144+I,88+Q)-(176+I,96+Q)
,S,PSET
241 IFPPOINT(164+I,112+Q)=1THEN2
45
243 PUT(144+I,108+Q)-(176+I,116+
Q),S,PSET
245 IFPPOINT(164+I,132+Q)=1THEN2
49
247 PUT(144+I,128+Q)-(176+I,136+
Q),S,PSET
249 GOSUB253:NEXTI
251 GOTO137
253 IFPPOINT(Z+14,190)=1THEN307E
LSEIFPPOINT(Z+19,190)=1THEN307EL
SEIFPPOINT(Z+24,190)=1THEN307
255 FORB=1TO11:IFC=1THENGOSUB283
257 IFW=1THENGOSUB287
259 NEXTB:IFW=1THENRETURN
261 FORT=1TO10
263 W$=INKEY$
265 IFW$=CHR$(8)THENGOSUB273ELSE
IFW$=CHR$(9)THENGOSUB277ELSEIFW$
=CHR$(32)THENGOSUB287
267 NEXTT
269 RETURN
271 PCLS:GOTO151
273 Z=Z-12:IFZ<=4THENZ=4
275 GOSUB281:RETURN
277 Z=Z+12:IFZ=>216THENZ=216
279 GOSUB281:RETURN
281 PUT(0+Z,185)-(37+Z,192),F,PS
ET:RETURN
283 PUT(Z+8,179-K)-(Z+24,177-K),
E,PSET:PUT(Z-4,185-K)-(Z+39,175-
K),E,PSET:LINE(Z-4,188-K)-(Z+39,
174-K),PRESET,BF:SCREEN1,1:POKE6
5494,0:FORV=1TO2:PLAY"V3105L255B
CO3BC":NEXTV:POKE65495,0:SCREEN1
,0:W=0:C=0:PSET(Z+19,183-K,1):K=
0:M1=M1+1
285 GOSUB295:RETURN
287 W=1:PSET(Z+19,183-K,1):K=K+6
:IFPPOINT(Z+19,183-K)=2THENC=1EL
SEIFPPOINT(Z+18,183-K)=2THENC=1E
LSEIFPPOINT(Z+17,183-K)=2THENC=1
289 PSET(Z+19,183-K,3):IFK=>156T
HEN293
291 RETURN
293 PSET(Z+19,183-K,1):W=0:K=0:R
ETURN
295 GOSUB79:DRAW"S8BM13,20;"+Q$+
MG$+Q$+MF$+Q$:DRAWME$+Q$+MD$+Q$:
DRAWMC$+Q$+MA$+Q$+MB$:RETURN
297 IFSB=1THEN302
299 XB=RND(3):IFXB=3THEN301ELSER
ETURN
301 SB=1:SC=RND(180)+35:RETURN
302 IFPPOINT(SC,160)=1THENBL=192
ELSEBL=165
303 SB=0:DRAW"S4BM"+STR$(SC)+",1
44;C2"+GB$:POKE65494,0:PLAYQQ$:P
OKE65495,0:LINE(SC,146)-(SC,BL),
PSET:PUT(SC-11,BL-18)-(SC+11,BL)
,E,PSET:LINE(SC-11,BL-18)-(SC+11
,BL),PRESET,BF:SCREEN1,1:SCREEN1
,0:LINE(SC,146)-(SC,BL),PRESET:D
RAW"BM"+STR$(SC)+",144;C1"+GB
305 RETURN
```

(Continued on Page 30)

TURN OFF THAT MOTOR...FAST

So you want to turn the motor of your tape recorder on and off a lot, but really don't like to hassle with the MOTOR ON and MOTOR OFF sequence from the keyboard.

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But, to turn the motor off once its on, there is a super-simple way. Just create a syntax error. This can be done by pressing any key and then ENTER. You'll get a ?SN ERROR message on the screen, but the motor will turn off, too.

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BRICKAWAY

Here is an inexpensive ($7, from Britt Monk, CDP, P.O. Box 802, Elyria, OH 44036) "Breakaway"-type game that can provide some enjoyment.

At the price, its a nice game. BRICKAWAY isn't as sophisticated as the games you'll find in the arcades, but it does have a number of the features necessary to keep the whole thing interesting.

What you have, essentially, is a brick wall across the top of the screen with three rows of bricks. As you break them down, your score increases. And, if you make it through and get your "ball" between the wall and the top of the screen, the ball bounces up and down very quickly, with the score mounting.

The paddle you use to hit the ball is controlled by the right joystick and you can put some "English" on your shots, sending the ball off in a different direction. The ball can take a strange bounce, too, when it hits the edge of a brick. This means there is some skill involved in playing.

Author Monk has thoughtfully displayed his own high score, giving you something to shoot at. If you do, though, you can't replace his high score with yours.

SNAIL From Pg. 29

```
307 FORDS=1TO4:PUT(Z+8,184)-(Z+3
0,192),E,PSET:LINE(Z+8,184)-(Z+3
0,192),PRESET,BF:NEXTDS
309 SR=SR-1
311 COLOR3,1:DRAW"S4BM"+STR$(126
+(34*(1+SR)))+",18;C1"+GG$+"U2R1
3":POKE65494,0:SOUND1,4:POKE6549
5,0:GOSUB281:IFSR=0THEN313ELSE25
5
313 SCREEN1,1:POKE65494,0:FORI=2
00TO20STEP-20:SOUNDI,1:NEXT
315 FORI=1TO1000:NEXT:RUN
317 ' "SNAIL INVADERS" BY FRED
    B. SCERBO AND DALE "SNAIL"
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COLORCOM/E

It seems like it gets easier and easier to hook up with data banks like CompuServe and BBS' like the Color Connection. And now, with COLORCOM/E (Connection-80, 93-15 86 Drive, Woodhaven, NY, 11421, $49.95) its even easier than ever before.

We recall when "they" told us there was no way to print out from the Videotex program. A couple of RAINBOW's authors solved that one months ago. Then we figured out how to download from a host computer to tape, saving programs without having to type them in all over again.

Now, another step. COLORCOM/E gives you the super convenience of a ROM Cart to load the program and a very versatile program that can do a lot of excellent things.

For example, you can print out the entire dialog between your computer/terminal and a host computer, or you can "mark" certain areas to be printed, ignoring the rest. Or, you can use the same "marking" situation to save to tape. And all of this is done offline, when it doesn't cost any money in connect time.

COLORCOM/E also has true scrolling, either 12 or one lines at a time. That really makes it easy not only to find what you want, but to mark it for printing or saving.

There's also a word wrap mode, which eliminates split words if you like, and easily-changed baud rates to accomodate any host. And, there's NO tape to fool with, the ROM Cart makes this a very easy system with which to work.

Although there are a lot of features available with COLORCOM/E, the program is extremely easy to operate. And this is helped by the documentation, which is really good. I had COLORCOM/E up and running in five minutes, and was saving to tape and printer just as soon as I got off the phone.

If you're interested in communication, COLORCOM/E will be a valuable addition to your Color Computer.

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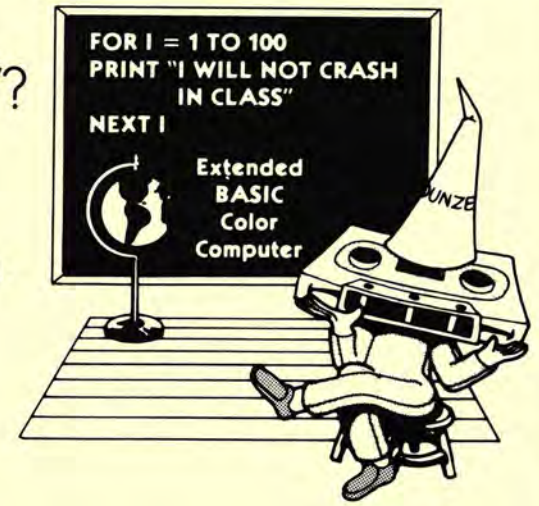

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